

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)
2. (Currently amended) A surface emitting laser comprising:
a semiconductor substrate;
an active layer formed on a first major surface of said semiconductor substrate;
a first optical reflector interposed between said semiconductor substrate and said active layer; and
a second optical reflector provided ~~above~~ on a superstrate side of said active layer,
said first and second optical reflectors exciting resonance of light in said active layer in a direction substantially normal to the major surface of said substrate,
said active layer having side surfaces at the longitudinal ends of the active layer, and
the side surfaces of said active layer offset from vertical planes normal to the major surface of said semiconductor substrate, ~~said semiconductor substrate and said active layer are made of a semiconductor having a zincblende crystalline structure, said first major surface of said semiconductor substrate having a surface orientation parallel to the {100} plane, said side surface of said active layer having a surface orientation parallel to the {111} plane.~~
3. (Canceled)
4. (Previously presented) The surface emitting laser according to claim 2 wherein said semiconductor substrate and said active layer are made of semiconductors having a zincblende crystalline structure,

said first major surface of said semiconductor substrate having a surface orientation slanted by an angle not less than 3° from the {100} plane,

said side surfaces of said active layer having a surface orientation parallel to the {011} plane.

5. (Original) The surface emitting laser according to claim 4 wherein said side surface of said active layer are made by cleavage.

6. (Canceled)

7. (Previously presented) The surface emitting laser according to claim 2 further comprising:

a waveguide layer provided on said first major surface of said semiconductor substrate and having formed 2nd-order gratings along the waveguide direction,

facets of said active layer and facets of said waveguide layer at opposite ends in the waveguide direction being offset from vertical planes normal to said first major surface of said substrate.

8. (Previously presented) The surface emitting laser according to claim 7 wherein said semiconductor substrate, said active layer and said waveguide layer are made of semiconductors having a zincblende crystalline structure,

said first major surface of said semiconductor substrate having a surface orientation parallel to the {100} plane,

said facets of said active layer and said facets of said waveguide layer having a surface orientation parallel to the {111} plane.

9. (Previously presented) The surface emitting laser according to claim 7 wherein said semiconductor substrate, said active layer and said waveguide layer are made of semiconductors having a zincblende crystalline structure,

said first major surface of said semiconductor substrate having a surface orientation slanted by an angle not less than 3° from the {100} plane,

said facets of said active layer and said facets of said waveguide layer having a surface orientation parallel to the {011} plane.

10. (Original) The surface emitting laser according to claim 9 wherein said facets of said active layer and said facets of said waveguide layer are made by cleavage.

11. (Original) The surface emitting laser according to claim 7 further comprising:

a cladding layer provided on said waveguide layer; and
an electrode provided on said cladding layer,
said cladding layer being selectively made in a central part of said laser to form a ridge stripe,

said electrode being electrically connected above said ridge stripe but electrically insulated near facets at opposite ends of said ridge stripe.

12. (Previously presented) The surface emitting laser according to claim 11 wherein said semiconductor substrate, said active layer and said waveguide layer are made of semiconductors having a zincblende crystalline structure,

said first major surface of said semiconductor substrate having a surface orientation parallel to the {100} plane,

said facets of said active layer and said facets of said waveguide layer having a surface orientation parallel to the {111} plane.

13. (Previously presented) The surface emitting laser according to claim 11 wherein said semiconductor substrate, said active layer and said waveguide layer are made of semiconductors having a zincblende crystalline structure,

said first major surface of said semiconductor substrate having a surface orientation slanted by an angle not less than 3° from the {100} plane,

said facets of said active layer and said facets of said waveguide layer having a surface orientation parallel to the {011} plane.

14. (Original) The surface emitting laser according to claim 13 wherein said facets of said active layer and said facets of said waveguide layer are made by cleavage.

15. (Original) The surface emitting laser according to claim 7 wherein said 2nd-order gratings have a asymmetric cross-sectional configuration.

16. (Original) The surface emitting laser according to claim 7 wherein an anti-reflection coating of a dielectric thin film is applied onto said facets of said active layer.

17. (Previously Presented) A surface emitting laser comprising:

a semiconductor substrate;

an active layer provided on a first major surface of said semiconductor substrate; and

a waveguide layer provided over said active layer on said first major surface of said semiconductor substrate and having formed 2nd-order gratings along the waveguide direction,

said laser having a substantially rectangular element configuration when viewed from a direction normal to said first major surface of said semiconductor substrate,

any of side surfaces of said substantially rectangular element being cleaved surfaces and the cleaved surfaces are offset from the vertical planes normal to the first major surface of the semiconductor substrate;

said waveguide direction being not parallel with any of sides of the substantial rectangle.

18. (Original) The surface emitting laser according to claim 17 wherein said waveguide direction being offset by an angle other than 45° from any of the sides of the substantial rectangle.

19. (Original) The surface emitting laser according to claim 17 wherein said 2nd-order gratings have a asymmetric cross-sectional configuration.

20. (Canceled)

21. (New) A surface emitting laser comprising:

a semiconductor substrate;

an active layer on a first major surface of said semiconductor substrate; and

one or more reflective or diffractive optical elements formed on a substrate or superstrate side of the active layer for exciting resonance of light in the active layer in a direction substantially normal to said major surface of said substrate,

said active layer having planar side surfaces which are offset from vertical planes normal to said major surface of said semiconductor substrate to prevent in-plane horizontal resonance of light in said active layer, and

said side surface of said active layer being made by cleavage.

22. (New) The surface emitting laser according to claim 21 wherein an anti-reflection dielectric thin film is coated onto said side surface of said active layer.

23. (New) The surface emitting laser according to claim 18 wherein said 2nd-order gratings have a asymmetric cross-sectional configuration.

24. (New) The surface emitting laser according to claim 2 wherein said semiconductor substrate and said active layer are made of semiconductors having a zincblende crystalline structure,

said first major surface of said semiconductor substrate having a surface orientation parallel to the {100} plane,

said side surfaces of said active layer having a surface orientation parallel to the {111} plane.